
Maintenance

This chapter describes Meridian Integrated Conference Bridge (MICB) maintenance tools and procedures to guide you in identifying the MICB faults, locating defective equipment, correcting problems by fixing or replacing defective equipment, and verifying the operation of the MICB after corrections or replacements have been made.

Maintenance overview

The problem identification should be approached systematically. A problem may have more than one cause. To isolate the cause, a knowledge of MICB operation is required. Once the cause is identified, the problem can be corrected by replacing the defective card, connecting accidentally disconnected cables, or correcting the software security problem.

The system and the MICB provide built-in self-diagnostic indicators and software and hardware tools. These diagnostic facilities simplify system troubleshooting and reduce mean-time-to-repair (MTTR).

This document focuses on the maintenance of the MICB equipment. It requires that system operates correctly before you start diagnosing the MICB problems. The system installation and maintenance guide documents: *Meridian 1 general maintenance information* (553-3001-500), *Meridian 1 fault clearing* (553-3001-510), and *Meridian 1 hardware replacement* (553-3001-520) describe how to maintain the entire system. This chapter describes how to maintain the MICB as an integral part of the system.

Diagnostic tools

Diagnostic tools are used to troubleshoot problems in the system including problems with the MICB. When diagnosing MICB problems, you may have to use more than one of these tools.

System diagnostic tools consist of:

- LED indicators
- display codes
- card self-tests
- sanity monitoring
- overlay commands
- history files

MICB status LED indicator

The MICB has a card LED indicator at the top of the faceplate. The card LED is a red LED that indicates the status of the card. If the LED is ON, the card may be faulty or disabled. When the card is powered up, it blinks 3 times during self-test and then stays ON if functioning correctly, otherwise it turns ON without blinking and stays ON. The LED turns OFF when the card is software enabled.

Self-test

A self-test is automatically performed by each MICB card when you insert it into an operating system module or when you power up or reset the system. You can also perform a self-test on a card using software commands or menus.

The self-test checks general MICB functions and determines if they are operating correctly. It is very useful when you first install the cards because, upon insertion, the card automatically starts the self-test and gives you an immediate indication of its operating status.

Self-test performs a detail test and analysis of the installed hardware both to determine the integrity of the hardware and to establish the configuration of MICB card by checking the processor, the RAM capacity, the Flash memory, the DSP and etc.

Table 15
MICB self-test sequence

Item tested	Description of action
Processor/Coprocessor	Read and store processor ID. Run processor self-test.
DRAM	Check the amount of DRAM installed. Perform R/W test.
PCI Chipset	Perform R/W test on selected registers.
System I/O Controller	Perform R/W test on selected registers.
PCMCIA Controller	Perform R/W test on selected registers.
DS-30X Interface	Test shared memory and perform loopback test over SD-30 LCA.
CE-MUX Interface	Test shared memory and perform loopback test over CE-MUX LCA
PCMCIA DSP card(s)	Check the presence of DSP cards and initiate diagnostic tests on DSP cards, if present.
PCMCIA hard drive	Checks the presence of the hard drive and checks the configuration information.
PCMCIA Flash card	Check the presence of Flash memory and the MICB check configuration information.

Sanity monitoring

Sanity monitoring is a background routine that checks the operation of system

resources such as CPU activity memory allocation etc. This background routine attempts to restore normal system operation if the system performance has degraded to an unacceptable level. If all else fails, this routine will restart the system to try to restore it to normal operation. If the soft reset is not effective, a full board level reset is initiated. If reset is not successful, the maintenance LED would stay ON.

Overlay commands

Diagnostics are performed for every card as part of the daily routines, or may be invoked from a maintenance TTY or the SMP (when equipped). See the NTP titled *Meridian 1 system maintenance* (553-3001-520).

The MICB card appears as an Extended Digital Line card to a system in which it is installed. All relevant system maintenance commands for a Extended Digital Line card can therefore be used with MICB. Enabling and disabling of ACD digital telephone set M2616 is done in Overlay LD 32.

[Table 16](#) lists some of the commands used to control the MICB status and functions.

Table 16
Commands to enable/disable MICB channels

LD 32 Commands	Operation performed
DISC / ENLC	Disable / Enable specified card
DISU / ENLU	Disable / Enable specified channel
LOOP	Performs a network memory test, continuity test, and signaling test on the specified loop.
STAT	Get status of specified card /channel
LD 30 Command	Operation performed
UNTT	Performs self-test on the MICB.

All the above commands are handled by the MICB card exactly as they are by the Extended Digital Line card, transparently to the system.

History file

Information on any fault conditions are stored on the MICB card to provide a history file for the craftsperson. The file is in the form of a cyclical buffer, which is overwritten from the top when it runs out of space. It is configured to use memory resources efficiently.

MICB fault isolation and correction

Fault clearing procedures for the MICB are the same as for other IPE cards; refer to *Meridian 1 fault clearing* (553-3001-510) for more information.

Table 17 deals specifically with MICB service problems. To diagnose these problems, the table refers you to the test procedures in this manual that will most likely be able to resolve these problems based on the symptoms these problems are exhibiting.

Table 17
MICB equipment problems

Symptoms	Diagnosis	Solution
Red card LED on the MICB is permanently on.	Card is disabled or faulty.	Go to Procedure 1 , in this chapter to check the card status and perform self-test.
Display on the controller card shows fault codes.	Card faulty, failed self-test or problem communicating with peripheral equipment.	Go to Procedures 1 and 2 to check self-test and self-test on reset. Also refer to <i>X11 input/output guide</i> (553-3001-400) for a list of codes.
Error messages printed on the terminal or the Meridian 1 TTY.	Hardware or software problems with the MICB.	Note various error messages. Refer to <i>X11 input/output guide</i> (553-3001-400) for a list of these messages and their description. Based on the code's description, take the appropriate action to resolve the problem.

If you cannot resolve the problem after exhausting all available diagnostic tools and test procedures, make a list of all the symptoms you observed and contact your field service representative.

Procedure 1

MICB self-test steps

- 1 The card will self-test upon insertion.
- 2 Card LAN will poll the card.
- 3 If self-test passed, the card will send back “powered-up occurred” message.
- 4 Card LAN will request configuration data.
- 5 The card will return configuration data (card type, X12 signaling type, and TN mapping type 2).
- 6 Card LAN will enable the DS-30X signaling channel.
- 7 The MICB card will wait until it receives configuration data (trunk type, signaling type, balance impedance, etc.) via the DX-30X, but it will then discard this data.
- 8 The card will go into its main program loop.

Procedure 2

Reset MICB card command

- 1 Software will send a reset message to the card if no channels are busy.
- 2 The card will set all appropriate resources to disabled state and turn on the faceplate LED.
- 3 The MICB card will reset and self-test. Self-test results will be stored in case a later query is performed by the Meridian 1.
- 4 Card LAN will poll the card.
- 5 If self-test passes, the card will send back a message: “power-up occurred”.
- 6 Card LAN will request configuration data.
- 7 The card will return configuration data (card type, X12 signaling type, and TN mapping type 2) and enable DS-30X link.
- 8 Card LAN will enable the DS-30X signaling channel
- 9 The card will wait until it receives download configuration data (trunk type, signaling type, balance impedance, etc.) via the DS-30X, but it will then discard this data.
- 10 The card will go to its main program loop.

Card replacement

The MICB is based on PCMCIA technology. This allows you to remove the MICB from the IPE shelf indefinitely without losing the configuration data.

To replace the MICB card:

- 1** Disable the MICB card by loading the LD 32 overlay and executing the **DISC l s c** command, where **l**= loop, **s**= shelf or module, **c**= card in the module.
- 2** Remove the card from its card slot in the IPE module.
- 3** Remove all PCMCIA cards from the faulty MICB card.
- 4** Transfer all PCMCIA cards to the new MICB card.

Note: This procedure moves all software, configuration, and records to the replacement MICB card.

- 5** Transfer the Security Device from the faulty MICB to the replacement.
- 6** The keycode is reused. It is still installed on the PCMCIA card, which was removed from the faulty MICB.
- 7** Enable the new card by executing the **ENLC l s c** command.
- 8** Configure the newly installed MICB card.
- 9** Package the faulty MICB card and ship it to the repair center.